

WHAT IS CLAIMED IS:

1. An optical device, comprising:

a first fiber coupling optically coupled to a fiber, wherein the fiber is configured to propagate a beam of light;

a beam splitter/combiner optically coupled to the first fiber coupling, wherein the beam splitter/combiner is configured to split the beam of light into a first component of light and a second component of light or to combine the first component of light and the second component of light into the beam of light;

an isolator optically coupled to the beam splitter/combiner; and

a second fiber coupling optically coupled to the isolator and optically coupled to a first additional fiber and a second additional fiber, wherein the first additional fiber is configured to propagate the first component of light and the second additional fiber is configured to propagate the second component of light.

2. The optical device of claim 1, wherein the first fiber coupling comprises at least one lens.

3. The optical device of claim 1, wherein the fiber comprises an end having an optically polished surface.

4. The optical device of claim 1, wherein the fiber comprises an end having an optically polished surface angled to an optical axis of the fiber.

5. The optical device of claim 1, wherein the fiber comprises an end having an AR coating.

6. The optical device of claim 1, wherein the first fiber coupling comprises at least one lens, and wherein the at least one lens is configured to collimate the beam of light propagating from the fiber or focus the beam of light propagating to the fiber.

7. The optical device of claim 1, wherein the beam splitter/combiner comprises a polarized beam splitter/combiner.
8. The optical device of claim 1, wherein the beam splitter/combiner comprises a prism.
9. The optical device of claim 1, wherein the beam splitter/combiner comprises two optical wedges.
10. The optical device of claim 1, wherein the beam splitter/combiner comprises two optical wedges, and wherein the optical axes of the two optical wedges are about 90° away from each other.
11. The optical device of claim 1, wherein the first and second components of light comprise substantially different polarization directions.
12. The optical device of claim 1, wherein the first and second components of light comprise substantially perpendicular polarization directions.
13. The optical device of claim 1, wherein the isolator comprises a Faraday isolator.
14. The optical device of claim 1, wherein the isolator is configured to inhibit optical feedback.
15. The optical device of claim 1, wherein the isolator is configured to inhibit optical feedback to either the first fiber coupling or the second fiber coupling depending on a use of the optical device.
16. The optical device of claim 1, wherein the isolator is configured to inhibit optical feedback to the first fiber coupling when the optical device is configured to be used as a beam splitter.

17. The optical device of claim 1, wherein the isolator is configured to inhibit optical feedback to the second fiber coupling when the optical device is configured to be used as a beam combiner.

18. The optical device of claim 1, wherein an isolation direction of the isolator is switched to inhibit optical feedback to either the first fiber coupling or the second fiber coupling.

19. The optical device of claim 1, wherein the isolator comprises a Faraday rotator, and wherein an isolation direction of the Faraday rotator can be switched mechanically.

20. The optical device of claim 1, wherein the isolator comprises a Faraday rotator, and wherein an isolation direction of the Faraday rotator can be switched electrically.

21. The optical device of claim 1, wherein the isolator is configured to provide about 30 dB optical isolation.

22. The optical device of claim 1, wherein the second fiber coupling is configured to focus the first and second components of light propagating into the first additional and second additional fibers, respectively, or to collimate the first and second components of light propagating from the first additional and second additional fibers, respectively.

23. The optical device of claim 1, wherein the second fiber coupling comprises a single lens.

24. The optical device of claim 1, wherein the second fiber coupling comprises at least one lens for each component of light.

25. The optical device of claim 1, wherein the first additional and second additional fibers comprise single mode fibers.

26. The optical device of claim 1, wherein the first additional and second additional fibers comprise multimode fibers.

27. The optical device of claim 1, wherein the first additional and second additional fibers comprise PM fibers.

28. The optical device of claim 1, wherein the first additional and second additional fibers comprise ends having optically polished surfaces.

29. The optical device of claim 1, wherein the first additional and second additional fibers comprise ends having optically polished surfaces angled to optical axes of the fibers.

30. The optical device of claim 1, wherein the first additional and second additional fibers comprise ends having AR coatings.

31. The optical device of claim 1, wherein the optical device is configured to be used as a beam splitter.

32. The optical device of claim 1, wherein the optical device is configured to be used as a beam combiner.

33. The optical device of claim 1, wherein the optical device is used as a passive device.

34. The optical device of claim 1, wherein the optical device is coupled to a laser.

35. The optical device of claim 1, wherein the optical device is used in an amplifier.

36. The optical device of claim 1, wherein the optical device is used in an optical network.

37. An optical beam splitting device, comprising:

a first fiber coupling optically coupled to a fiber, wherein the fiber is configured to propagate a beam of light;

a beam splitter optically coupled to the first fiber coupling, wherein the beam splitter is configured to split the beam of light into a first component of light and a second component of light;

an isolator optically coupled to the beam splitter; and

a second fiber coupling optically coupled to the isolator and optically coupled to a first additional fiber and a second additional fiber, wherein the first additional fiber is configured to propagate the first component of light and the second additional fiber is configured to propagate the second component of light.

38. The optical beam splitting device of claim 37, wherein the device can be used as a beam combiner.

39. The optical beam splitting device of claim 37, wherein an isolation direction of the isolator can be switched to use the device as a beam combiner.

40. An optical beam combining device, comprising:

a second fiber coupling optically coupled to a first fiber and a second fiber, wherein the first fiber is configured to propagate a first component of light and the second fiber is configured to propagate a second component of light;

a beam combiner optically coupled to the second fiber coupling, wherein the beam combiner is configured to combine the first component of light and the second component of light into a beam of light;

an isolator optically coupled to the beam combiner; and

a first fiber coupling optically coupled to the isolator and optically coupled to an additional fiber, wherein the additional fiber is configured to propagate the beam of light.

41. The optical beam combining device of claim 40, wherein the device can be used as a beam splitter.

42. The optical beam combining device of claim 40, wherein an isolation direction of the isolator can be switched to use the device as a beam splitter.

43. An optical device, comprising:

a first fiber coupling optically coupled to at least one fiber, wherein the at least one fiber is configured to propagate at least one beam of light;

a beam splitter/combiner optically coupled to the first fiber coupling, wherein the beam splitter/combiner is configured to split the at least one beam of light into at least two components of light or to combine the at least two components into the at least one beam of light;

an isolator optically coupled to the beam splitter/combiner; and

a second fiber coupling optically coupled to the isolator and optically coupled to at least two additional fibers, wherein each of the at least two additional fibers is configured to propagate at least one of the at least two components of light.

44. The optical device of claim 43, wherein the isolator is configured to inhibit optical feedback to either the first fiber coupling or the second fiber coupling depending on a use of the optical device.

45. The optical device of claim 43, wherein the isolator is configured to inhibit optical feedback to the first fiber coupling when the optical device is configured to be used as a beam splitter.

46. The optical device of claim 43, wherein the isolator is configured to inhibit optical feedback to the second fiber coupling when the optical device is configured to be used as a beam combiner.

47. The optical device of claim 43, wherein an isolation direction of the isolator is switched to inhibit optical feedback to either the first fiber coupling or the second fiber coupling.

48. An optical beam splitting device, comprising:

a first fiber coupling optically coupled to at least one fiber, wherein the at least one fiber is configured to propagate at least one beam of light;

a beam splitter optically coupled to the first fiber coupling, wherein the beam splitter is configured to split the at least one beam of light into at least two components of light;

an isolator optically coupled to the beam splitter; and

a second fiber coupling optically coupled to the isolator and optically coupled to at least two additional fibers, wherein each of the at least two additional fibers is configured to propagate at least one of the at least two components of light.

49. The optical beam splitting device of claim 48, wherein the device can be used as a beam combiner.

50. The optical beam splitting device of claim 48, wherein an isolation direction of the isolator can be switched to use the device as a beam combiner.

51. An optical beam combining device, comprising:

a second fiber coupling optically coupled to at least two fibers, wherein each of the at least two fibers is configured to propagate at least one of at least two components of light;

a beam combiner optically coupled to the second fiber coupling, wherein the beam combiner is configured to combine the at least two components of light into at least one beam of light;

an isolator optically coupled to the beam combiner; and

a first fiber coupling optically coupled to the isolator and optically coupled to at least one additional fiber, wherein the at least one additional fiber is configured to propagate the at least one beam of light.

52. The optical beam combining device of claim 51, wherein the device can be used as a beam splitter.

53. The optical beam combining device of claim 51, wherein an isolation direction of the isolator can be switched to use the device as a beam splitter.

54. A method for splitting a beam of light or combining two components of light with a single optical device, comprising:

propagating a beam of light through a fiber;

splitting the beam of light into a first component of light and a second component of light or combining the first component of light and the second component of light into the beam of light;

inhibiting optical feedback with an isolator;

propagating the first component of light through a first additional fiber; and

propagating the second component of light through a second additional fiber.

55. The method of claim 54, further comprising polarizing the first and second components of light such that the first component of light is polarized about 90° from the second component of light.

56. The method of claim 54, further comprising switching the isolator to inhibit optical feedback to either the fiber or the first additional fiber and the second additional fiber.

57. The method of claim 54, further comprising switching the isolator to inhibit optical feedback to the fiber when splitting the beam of light into the first component of light and the second component of light.



58. The method of claim 54, further comprising switching the isolator to inhibit optical feedback to the first additional fiber and the second additional fiber when combining the first component of light and the second component of light into the beam of light.

59. A method for splitting a beam of light, comprising:

- propagating a beam of light through a fiber;
- splitting the beam of light into a first component of light and a second component of light;
- inhibiting optical feedback with an isolator;
- propagating the first component of light through a first additional fiber; and
- propagating the second component of light through a second additional fiber.

60. The method of claim 59, further comprising polarizing the first and second components of light such that the first component of light is polarized about 90° from the second component of light.

61. A method for combining components of light, comprising:

- propagating a first component of light through a first fiber;
- propagating a second component of light through a second fiber;
- combining the first component of light and the second component of light into a combined beam of light;
- inhibiting optical feedback with an isolator; and
- propagating the combined beam of light through an additional fiber.

62. The method of claim 61, wherein the first component of light is polarized about 90° from the second component of light.